ITEMS OF INTEREST.

VOL. VI. PHILADELPHIA, APRIL, 1883. No. 4.

Editorial.

TREATMENT OF EXPOSED TOOTH-PULPS.

This branch of dental practice is so important that, in spite of seeming to repeat ourselves, we would like to give a few suggestions, founded on our experience. This, we think, teaches that the necessity for destroying an exposed pulp of a tooth is rare, even though it has been long exposed, is chronically inflamed, or when the exposed surface is partially decomposed

Of course, there is nothing difficult in its salvation when freshly exposed by an excavator; and yet, not long ago, as we were passing through the operating-room of one of our dental colleges, a student called to us: "Dr. Welch, come here a minute. I wish you would tell me where the nerve is in this tooth. I have exposed the nerves in two teeth for this man, and have treated them to arsenious paste; I am afraid I am coming to another." Why! such a student, it seems to us, should not have arsenic within ten miles of him. But many dentists, with long practice, have it very close at hand, and think of nothing else when a pulp is exposed.

A very small amount of the powder of the oxyphosphate mixed to a thick paste with one part oil of cloves and two parts carbolic acid, put on a tiny bit of paper, and placed over the exposed pulp, is sufficient. If the pulp is healthy, it is as well, after swabbing the cavity with the oils, to place over the pulp, instead of the above, a bit of moistened, flexible silk court plaster. The cavity is then filled with oxyphosphate, mixed sufficiently thin not to require much pressure. When this has set, cut back a little of it, and plate with gold, if a front tooth, or with gold and platina alloy, if out of sight.

If the tooth is one that has been aching, and perhaps is aching at the time of treatment, the better plan is to put into the cavity a soothing lotion. The quieting effect of this is often increased by throwing on

to the tooth quite warm air from a hot blast syringe. "Heaven's cordial," as we used to call it in our practice, is very good.

If the patient is nervous and excited, perhaps suffering from headache, it is well also to let a little be breathed from a cloth, and to put a little on the head. It is made as follows: Alcohol (best) 1 oz., chloroform 2 ozs., sulphuric ether ¾ oz., gum camphor ½ oz., laudanum ⅛ oz., oil cloves ½ dr.

There is not much fear but that, in a short time, your patient will be "as calm as a summer evening breeze," and that the toothache has been "wafted away upon the gentle zephyrs."

It is not well to excavate such teeth deeply. You may wake up the sleeping imp. Besides, the dentine lying over the troubled pulp is a better permanent protection than any artificial covering. Treat it to the clove and carbolic oils, and this will become tanned into leather. The first time our attention was called to this fact, was by a case where, two years previously, a dentist had put into an aching wisdom tooth a pellet of cotton, saturated with this preparation. The lady had been prevented from returning to her dentist according to appointment, "after the tooth should stop aching." It ceased aching soon after she left his office, and had never troubled her since. She thought she now felt an uncomfortable feeling there, and wanted us to see to it. We were astonished to find the cotton still there, and to be assured by her that this was the only trouble it had given her for these two years. We took it for granted, the tooth was dead; but, as we proceeded to excavate, soon found sensation and life, and concluded to give it another dose of clove oil and carbolic acid. Our interference had produced some ache, but the application of the medicine soon soothed it; and, after considerably enlarging the entrance and cutting away carefully around the margin of the cavity, we filled with oxyphosphate, leaving the old leathery laminations of dentine undisturbed. Then, cutting this filling back a little, we plated it with alloy. When again heard from—a year afterward—she had experienced no trouble from it.

The oxyphosphate, also, assists in this tanning process. We therefore consider it the best filling in these cases; not only because it can be introduced without pressure upon the pulp, but also because of its effect in arresting disease and hardening the tooth substance.

If the pulp has been long exposed, and is, therefore, in a chronically inflamed condition, the better way is to excavate with the engine bur, almost as though no pulp was there—cutting it as freely as the decayed tooth bone. There is only one thing to guard against: to see that the debris is not forced into the pulp cavity. To prevent this, first enlarge the orifice till you have strong walls, burring out against these walls in all directions, then rinsing out the chips with warm water

from the syringe. You will generally find the protruding pulp quite enlarged from its natural size. Now cut this off freely with the rapid motion of a sharp bur. Its bleeding for a few minutes will do it good. Moisten your cavity with the oils, cover the pulp with the powder made into a thick paste with the oils, as in the other cases, and fill with oxyphosphate. There is seldom much pain in the whole process. Even cutting the pulp gives but little sensation—its circulation is too sluggish for that. If there is pain, "Heaven's cordial" will soon soothe it, and having some in the cavity while it is being excavated, will generally prevent it.

When the exposed surface of the pulp has decomposed, this treatment will generally be found effective. Of course, in this case, after cutting off the decomposed portion, and treating with the oils, the cavity is left filled with absorbent cotton covered with sanderach varnish, for a few days. If then there is any fresh accumulation of matter, the cavity is to be rinsed again with warm water, and, after drying with quite warm air from the hot-blast syringe, the cavity is sealed for a few days, as before. It is not generally necessary to repeat the application of the oils. As in all medications, we must remember, we can do too much as well as too little. Usually, in forty-eight hours, it will be ready for a soft oxyphosphate filling, the pulp being first protected as in the other instances. We do not plate with metal in these cases for some months, because there may be a reaccumulation of matter, indicated by the sense of pressure and pain. Then the temporary filling must be removed; the accumulated matter rinsed away, and the treatment repeated. But "don't give up the ship"—for patient, intelligent treatment will generally give final success.

SHALL WE ABANDON RUBBER?

Rubber has been brought into such disrepute by the low prices, the misfits, and the bungling work of charlatans, that intelligent dentists are seriously asking if they had not better abandon it altogether. Continuous gum, gold, aluminum, Reese's metal, celluloid, etc., have each their excellencies, but rubber, too, has its advantages. We think it should not be abandoned, because:

First. It is the most plastic material we have, and in this state is applied so directly to the model that in the hands of intelligent manipulators, a good fit is assured.

Second. It is the most elastic material. Gold alloyed with a fourth its weight of silver and copper is considerably so; but even this, when bent, does not come back to its former shape so completely as rubber. The other materials in this respect are quite faulty.

Third. It is the strongest material used for this purpose. Gold,

perhaps, is as strong, if not subjected to the constant springing inevitable on a shrinking mouth, or where severe strain has caused faulty articulation. But take it, all in all, we had not half the trouble in artificial work, while using rubber, from breaks or fractures, etc., or of teeth breaking from the plates, as we had formerly when using gold.

Fourth, It is the most durable material for these dentures. It may be said to be almost indestructible. We never saw a properly constructed rubber plate which was worn out.

Fifth. It is light and pleasant to wear. With our patients it always gave much better satisfaction than gold or other material. Some dentists, it seems, have received complaints of its heating the mouth; we never have. Others that it inflames the mouth. We never saw a case where such inflammation seemed to be caused by the nature of the rubber or its compound. We have seen such a condition of the mouth while wearing rubber, but not more frequently than when gold or celluloid or continuous gum was worn, and in each case from the same causes: generally from the want of cleanliness. (Oh! such filth between the plate and roof! Whole months without the removal of the plate! Who can wonder at a sore mouth?) Sometimes it is caused by the suction of the plate on over-sensitive mucous membranes of the mouth; and occasionally, perhaps—but very seldom—to the heat produced by the surface of the mouth being covered. This latter almost invariably disappears in time, or by leaving the plate out of nights. In fact, we have yet to see a case of a properly fitting plate of either of the above named materials that produced inflammation of the roof of the mouth, where the plate was placed in a little soda water over night. "The ulceration of the muscles," sometimes complained of as caused by "rubber poisoning," is always produced—as with plates of other materials—by the edge of the plate riding upon and cutting into these muscles. Such cases are always cured by remedying this defect.

Of course, when we speak of rubber being superior, for elasticity, strength and durability, we mean good rubber. There are rubbers on the market so loaded with kaolin or other earths that it is astonishing it can be sold at any price; and especially that, from the ignorance of purchasers, such rubber so often successsully competes with rubber of good quality.

We know the ease with which tinkers can make rubber plates, and the fact that they are generally made very poorly and without artistic taste or adaptation has degenerated rubber for dental use. But, on this account, for intelligent dentists to abandon it, is foolish. Good work with good rubber, and teeth looking natural and working successfully, will generally command a good price, if the dentist himself is not to blame. If, in using rubber, we lower our standard of workmanship and price to compete with any charlatan who may be in our neigh-

borhood, we suffer by our own fault, the same as, in a similar way, we may injure any part of our practice. Let a dentist show ability to do first-class work, and put his prices accordingly, and he will be patronized the more by the better, more liberal and appreciative class of the community.

At any time during our thirty years practice, if we found ourselves losing ground because someone did work for less prices, we made up our mind that the quality of our work needed bettering; for we were conscious our prices were not extravagant for good work; and as sure as competition in prices stimulated us to improve our workmanship, it was sure to improve our patronage.

LIFE INSURANCE.

Every time we hear of one and another dentist dying, we ask ourselves: "I wonder if he was insured?" It seems sad to see so many lonely women left without the means of support, who, while their husbands lived, were nicely provided for, but, from the very fact, perhaps that their husbands were too generous, are now left in real want. How much better to make frugality in prosperity a help in adversity. We all know that a life insurance policy of five thousand dollars requires but little constant saving—a saving which is almost sure not to deprive us of any real need, and which improves our whole moral and physical standing, by giving us habits of economy and thoughtfulness. Dentists, perhaps, more than many other class, are poor business managers. They earn more easily, some of them quite fast, but few save much. The more they earn the more they spend. If they have some special motive for saving they are more likely to save. At least one special feature is attached to life insurance which commends itself to such persons: When once a policy is taken, it is a constantly increasing incentive to save. It cannot be thrown up to please every whim which may come over us without a loss much too great to pay for a whistle. The longer we keep it the more it is worth, and the more we are determined to keep it, till we are willing to make those "sacrifices" which, perhaps, our pride or our indulgence called for, but which, after they have passed us, we find were no "sacrifices" at all, and the non-indulgence of which is a real benefit.

Besides, is it not a real duty to thus "provide for our own?" How loth we would be to deliberately leave wife and children destitute, if we knew the time we were to be taken away from them! Yet what we should not be willing to do deliberately and of foreknowledge, we do thoughtlessly, because we are constantly feeling "there is time enough yet."

Life insurance is not only a final benefit to our loved ones, but is a

present comfort to ourselves. It brings peace of mind and a greater enjoyment in passing pleasure. It makes it easier to dismiss anxiety, and, while we are providing for the things of this life, we have more time and inclination to look into the life to come. We sleep better at night, and enjoy our wife and children the more, as we reflect that, though we should be taken away, they are provided for.

That some insurance companies fail, is no excuse for avoiding all. Banks break, and yet we risk them rather than keep our surplus money around our persons or in our houses. There is no investment we can make in which we do not assume some risk. But less life insurance companies fail than banks in proportion to their number. Investments in them are, perhaps, less hazardous than any other we can make. Extremely few old and well established life insurance companies have ever failed. They are not only managed with care and intelligence, but are closely scrutinized by the State, and the policy holders are carefully protected.

Some propose an insurance company to be composed specially of dentists, as there are companies of physicians, and ministers, and other special classes. We should perfer placing our funds in a company who for many years has made insurance a special business. Yet we are not particular, only so the company has really a safe basis, and is conducted on real business principles. The main thing is to be safe and permanently insured at a reasonable rate.

Of the special kind of policy preferable, little need be said here. There is such a variety, some one of them can hardly fail to please. If really but little can be saved from earnings, the policy requiring a certain amount yearly during the whole life is preferable. If earnings will allow it, a policy payable at death, but earned by ten annual payments, is a good one. This is on the principle that during ten years of the best part of our active life, we can more easily save than in more advanced age, and that, by-and-by, we may meet with some impediments to our earnings. We know some dentists who have these paid-up policies which are now a source of income. Where the means will allow it, a policy earned by ten annual payments, payable at a certain age—say at sixty—or at death, if before that age, is very good. A policy taken out jointly by husband and wife, payable upon the death of either, is good.

"You are a strong, healthy man;" we said to a neighbor, some time since, "but the utter dependence on your life of that wife and those children of yours, makes me sometimes wonder how you can take the entire risk—it seems to me you should allow some life insurance company to share it with you. Besides, if you were to die before that house of yours is paid for, they would be thrown out of doors, sure. Rich men can afford to take the entire risk of their life and their

property, but we poor men cannot." No argument seemed to effect him, and he passed on. Sometime after this he came into my office, saying: "I have such a cold, I am laying off to-day." "Now," we said, "go right into Dr. Pierce's and be examined for a life policy in the Etna."

"They would not take me as I am now."

"Try them."

He did try, and was rejected. "Now," we urged, "try the North Western. Go right over to their physician, and if he accepts you, take out a policy for $2000 before you return." They accepted him, and he came back elated. And there was little reason they should not accept him. He had been a stout, hearty man all his days, and now he had only "a cold," caught by imprudent exposure four days previous. No one would have thought there was any "danger." The doctor of the Etna did not; only he thought the man may as well wait till he was better. This was Tuesday—Friday he was a corpse. The insurance agent telegraphed to his company, not to send the policy, as the man was dead. They returned answer: "The policy is in the mail; send proof of death." Proof was sent, and the $2000 handed over to the widow. With $300 she paid off the mortgage on her house, and $1000 was lent to a reliable firm at a good interest, and the family were thus kept together in comfort. Without that policy they would have been thrown upon the town, for the children were small, and the wife's health poor, and they had no relatives to take them in.

LANCING the gums of children is not as frequently necessary as is generally supposed. Nature will generally take care of the process of teething without our interference. Much irritation and inflammatory symptoms are generally due to other causes than tension of the gum over outcoming teeth.

Still, there are cases where it is a mercy to interfere. Over incisors and cuspids a straight line should be cut in the direction of their cutting edge; over the molars, a cross cut. Care thould be taken not to injure the face of the tooth, and, though the operation is not usually painful, the child should be securely and advantageously held by an assistant as any sudden movement of the child may cause an accident.

PHYSICIANS AND POPULATION.—The *Practitioner* gives the following table as showing the proportion between physicians and population in the countries named:—France, 291 per million; Germany, 321; England, 600; Austria, 610; Italy, 610; Switzerland, 706; United States, 1624.

Thoughts from the Profession.

THE FIRST PERMANENT MOLAR.

BY DR. J. TAFT, ED. DENTAL REGISTER.

The hygienic regulations under which the child should be brought should be modified very much indeed. In many respects children are subject to disease-producing influences in a very marked degree. This is clearly shown by the large amount of infant mortality. Why is it that the young of other animals, which we would suppose are not cared for as those of the human kind ought to be, exhibit so great a disparity in the matter of mortality? Forty per cent., perhaps, of the human family die prior to the age of five years, showing that there is something radically wrong in the care, in the exercise of hygienic rules and regulations for their welfare—giving the best nutrition, giving the best support, surrounding them with the best circumstances, warding off the influences that produce disease; there is something radically wrong in all these particulars. During the formation and development of the teeth children are subjected to diseases of various kinds. Consequently the teeth will certainly undergo deterioration; they will not be developed as perfectly as they should be. Take, for example, the enamel. The organ may be atrophied for want of proper nutrition, and then it will be defective in one or more particulars, and in some instances the organ will be starved, and contraction will take place. Therefore, there is no union at the edges of the enamel in the fissures, and there will be those open points or fissures that we frequently find in the molar teeth. This occurs more frequently on first molars; these fissures are more marked ordinarily in the first molars and in the bicuspids than in any other teeth in the mouth, showing that there was interference at the time of formation of the organs that did not afterward occur. There will be exceptions, of course.

Then, again, defects in the enamel may be manifested in another direction. By want of proper nutrition the enamel may not receive its due amount of material for solidifying or calcification, and that will manifest itself in various ways—either in the pits and grooves, or the imperfect territories in the enamel, which will be shown by the whitened condition, by the change in the appearance of the enamel, defective spots. Sometimes the enamel is defective throughout. Now, the same thing may occur, without any appreciable reason, in the formation of the dentine. Reference should be had to the perfection of the teeth in the nutrition of the child during the time of the growth and development. Though it may be good in all these respects to

which I have referred, subsequent privation of nutrition will prevent the due solidification of the teeth. The tooth, at the time of eruption, has nothing like as much calcareous material in it as it ultimately receives, or will receive under proper nutrition. This, then, is a matter to which attention should be given through the growing period of the child; not only while the tooth-germ is forming, but while the tooth is being developed and growing, and afterward as well.

The period at which these teeth come is a very unfavorable one for the best interests and the welfare of the teeth. They come at a period when the child is susceptible to a great many disturbances, and many perturbations of health occur during this period. It is a time of life that is subject to irritability, and special susceptibility to morbific influences that surround and attach to it; and it is a vulnerable time in which, at any time, disease is liable to fasten upon this organ. Then, these teeth are erupted at a period when the mouth is oftentimes in a state of marked irritation. It is at the time of the throwing off of the temporary teeth, and ordinarily under the best circumstances there will be somewhat of irritation in the mouth during this period; and in so far as this condition exists are the permanent molars likely to suffer for want of exercise—for want of due use in mastication. The contiguous teeth are loosened, and there is irritation of the gum, and a vigorous use of them would occasion pain, and the inclination of the child, at this time, is to protect the teeth from irritation, and to avoid the use of them in mastication; and the result is that about these molars accumulations are generally found, and especially unless attention is given to the matter by the parent, or by someone having the child in charge. There will be more or less accumulations of vitiated matter about the teeth. That will be the rule with the first permanent molars, for a year or two after their eruption, a circumstance that directly favors their decay. The child should be stimulated or induced to use these teeth in mastication, from the time they make their appearance, sufficient to prevent the accumulation of foreign substances upon them. When we consider the amount of vitiated material and debris of one kind and another—agglutined mucous, decomposing material, and epithelial scales that cover them during the year or two following their eruption, the only wonder is that they escape so well as they do.

There is one fortunate circumstance in connection with this condition in the mouth, that during the time of this irritation there will be a large inflow of saliva, and a dilution of the deleterious agents. But this is not sufficient, in most cases, to neutralize or overcome the vitiated product and materials in the mouth that operate upon these teeth.

Then, again, the temporary molars are very frequentiy decayed upon their posterior proximate surfaces, in contact with the anterior proxi-

mate surfaces of the permanent molars, holding in contact with the latter material undergoing decomposition, out of which the materials that will produce decay are formed. They operate, then, upon the anterior surface of the permanent molars. This is a very common point of decay; and, in order to prevent that, special attention should be given to the teeth in this respect. And when there is decay upon the posterior surface of the temporary molar, it should be cut away. The diamond disk is a very good instrument for this purpose, as, with it, the separation can be very readily and easily made without annoyance to the child; whereas, the use of the file would be objectionable, and with many children it would be almost impossible to make such separation with the file. Very scrupulous search should also be made for decay in the anterior side of the permanent molar, and if there is incipient decay, let it be at once removed, and let the very best be done in the eradication of decayed points, and a complete, thorough polishing of the surface, and in the future let them be kept as clean as possible. If there is a point on the crown of these teeth where decay is beginning, that should be filled at once. Taking any ordinary case, by such care the first permanent molars may be, as it seems to me, preserved. But, unfortunately, a laage portion of these teeth are allowed to be destroyed before particular attention is given to them.

And, then, from the time of their eruption, they should be well and thoroughly used, which will accomplish two or three things: The friction keeps the teeth free from the deposit to which I referred, and the pressure exercised upon them gives strength to the periosteal attachment, and stimulates the circulation about the roots and into the pulp, and, of course, the bringing into the part an abundant supply of the nutrient material which it demands. In this way the tooth will be better conserved than if it was not properly exercised. This exercise can be given to the teeth in the use of such food as will require sufficient pressure upon the teeth, and sufficient exercise.

Sometimes, when one of these teeth is taken away, the second and third molars will come in and fill up the space, and there will be no loss; but in the great majority of cases this does not occur, to the complete filling up of the space that has been left by the removal of the first molar. At the age of seventeen, I had two first molars removed, and the spaces stand there to-day as large as when the teeth were taken away, and the other teeth did not move forward, or the other teeth go backward to fill up the space, and it has been a very great annoyance from that time to this. But sometimes the second molar will move forward, as a whole, and occupy the space of the first, to a considerable extent, and occasionally almost entirely, but these are exceptional cases. Often the second permanent molar will tip forward instead of moving forward in an upright position, and then

what is the result? You have the posterior corner of the tooth thrown up for occlusion with the opposing tooth above, and a large portion of the surface of the tooth is not used for breaking up the food, and there is imperfect mastication and insalivation of the food. Sometimes the bicuspid tips backward a little, and the same disturbance arises—the right occlusion for thorough mastication is destroyed. In the proper arrangement of these teeth for mastication they come together like the faces of millstones, and they operate, face to face, one upon the other. They are not thrown together, here a corner and there a corner, touching only at a few points.

It is said that the other teeth are preserved by the early removal of these teeth. Well, that depends very much upon circumstances. If proper care is given to the mouth, the other teeth will not suffer because these are retained. It is not necessary for us to cut off one of our fingers in order to save the others. No more is it necessary, recklessly to take away one tooth for the welfare of the other. I know that there may be cases of irregularity when it is necessary to do this. I am speaking now of those cases where the development and arrangement of the teeth are entirely normal. There is no occasion for the removal of the first permanent molar to preserve the other teeth, if the proper care is exercised on their behalf. I regard it as a very great misfortune, indeed, to sacrifice first permanent molars, and I think every effort should be made for their preservation and their retention in the mouth during life.

WHITE DECAY.

DR. GEORGE WATT says: When it is remembered that the immediate agent in producing white decay of the teeth is nitric acid, formed by the oxidation of ammonia, and that ammonia is always one of the results of the putrefaction of organic matter containing nitrogen and hydrogen, we can not see how it can be otherwise than penetrating. For, though nitric acid acts with energy on all the constituents of tooth substance, it dissolves the lime-salts more rapidly than it does the organic matter. The lime-salts being removed, the organic layer putrefies, ammonia results, this is oxidized, nitric acid is formed, which dissolves out more lime-salts, exposing a fresh layer of the organic tissue to putrefy, form ammonia, to be oxidized into nitric acid, to dissolve more lime-salts, and so on, on and on, till the pulp is reached.

Nitric acid thus formed becomes acid as soon as the requisite proportion of oxygen combines with nitrogen; and Liebig tells us this process always takes place when ammonia is exposed to oxygen not already combined. And we should bear in mind that it is formed in contact with substances for which it has strong affinities, and that, atom by

atom, it is neutralized as fast as formed, by combining with some or all the materials composing the tooth. So it can not be tasted nor found as free nitric acid, even by chemical analysis. The proper way to trace it is by its tracks. Look for nitrates, and the search will be successful.

SORE MOUTHS FROM RUBBER AND CELLULOID.

BY DR. A. P. JOHNSTONE, ANDERSON, S. C.

EDITOR ITEMS:

I hear much talk about the soreness of mouths caused by rubber and celluloid plates. Some claim that it is the coloring matter that is used in the manufacturing of the articles; others say that vermillion is not the cause, but that it is due to the material being a non-conductor. As yet, I am not satisfied in my own mind as to the cause. However, I freely admit that there are a great many mouths that prove the fact that rubber or celluloid plates will excite considerable inflammation. For my part, I am inclined to believe that if either a rubber or a celluloid plate is kept perfectly clean, there will be no trouble of this kind. A gold plate will irritate the mouth if allowed to become filthy.

Let me say just here, that, while I prefer a gold plate to either of the others, and everyone knows how much easier it is to keep clean, the filthiest thing I ever saw in the mouth, was a gold plate. The patient had worn it, according to her own statement, fourteen years without taking it out of her mouth. The plate had been put in on a clasp and she could not and did not seem to care to remove it, until she was forced to consult a dentist. I was a student at the time I saw this plate, and do not remember the condition of her mouth, but am under the impression that it required some treatment before she could have a correct impression taken of the parts. But to return. Dr. Robinson claims that this irritation comes from the rubber or celluloid plate being a non-conductor, and his method of applying a coating of tin, will correct all trouble from this source. I am not prepared to say this is so, or that it is not so. However, I do say that I believe it is better to have a conducting material next to the mucous membrane. This may be done in the following way:

Taking a piece of aluminum, roll it to the thickness of a piece of sheet tin, have it perforated as tin is done, between a die and counter-die, made of Babbit's metal, swage it to fit the model perfectly. This is easily done, as aluminum is very soft. Now tack it on the model in a few places, so that it will not move about on the model. Mount the teeth on wax, and finish as you would for an ordinary rubber or celluloid plate. A plate made in this way is much stronger, and there is no danger of the metal and rubber separating. If you wish some

suction other than a very closely fitting plate gives, you can, just before waxing up the set of teeth, rub some soap-stone or dry plaster in every other row of perforations. This will keep out the rubber, and when the soap-stone is washed out, you will have a gentle suction distributed all over the roof of the mouth. The better location for an air-chamber is on the rim of plate which extends from the second bicuspid to the second molar on both sides. All air-chambers, after a time, draw the soft tissue and fill up the chamber; so, when these air-chambers fill up, there remains a prominence of the soft tissue that will help considerably toward keeping up the plate.

SEPARATING THE TEETH.

BY DR. L. D. SHEPARD, OF BOSTON.

I would like to say what I consider an *essential* for a material for separating teeth, and what I consider a *non-essential.* As essential, I consider:

First. Non-elastic or very slightly expanding substances should be used.

Second. They should have sufficient firmness of texture so as to prevent the play of the teeth, and alternate movements.

Third. The space, after obtaining it, should be held firmly; the only movement should be one of separation.

Fourth. The increase of space should not be constant, but should have periods of movement and rest.

Fifth. The period of rest should be long enough—three to four days—to allow the teeth to recover from the soreness in the sockets, so that they can be operated on with as little pain as though they had not been moved.

Sixth. The substance should never press or touch the gums between the teeth.

Desirable; First. To devise a system of general adaptability combining the above essentials.

Second. To make such a system so simple to understand and easy to apply, that the patient can perform the service intelligently.

Third. To find a substance, agreeable to the patient in all respects possible.

These are my axioms. In examining them and the materials under this heading, I would remark that most materials, commonly used, do not conform to these requirements. One of the materials that conform least is unvulcanized rubber. It is elastic, has not sufficient body and firmness to prevent play; it does not answer to the third requirement, that the space should be held firmly; there is no period of rest—it works constantly; if periods of rest are there, they are

only very short; the substance presses against the gums, etc. I go from the worst to the best. This is *tape*, so saturated or charged with some substance as to render it of firmer texture, smoother on the surface, and lubricated; a non-absorbent of odor or fluids, and so saturated with a material that putrefaction is arrested.

I use wax, with one or perhaps two per cent. of glyzerol or thymol, on some tape. Formerly the only way to wax the tape was to get it on a board and to rub the wax into it; I never have heard of other methods of preparing tape. Now, the system which I give for my patients includes several things: First, the initial force should be very slight; the second point is that the force should be gradually increased, and the tape changed only once in twenty-four hours, to give a period of movement and a period of rest; the third rule is, that the motion of going back should be arrested—get what you can, keep what you obtain. The material should be left in until subsidence of soreness, and recovery to such normal conditions that the pressure and percussion should not produce pain. No portion of a tooth should be removed except for the best of causes; all space for working in difficultly accessible places should be obtained by moving the teeth, and not by filing, unless this is done for the good of the tooth itself. Another fact with my patients is, that the dread of the separation of the teeth is a thing of the past. One thickness of the tape will go between any teeth, unless there are sharp angles so as to cut it. You should not carry the tape too far up, but so that the pressure leaves a small width of tape above the point of nearest approach and below it. There is one other material I use besides tape, and this I do in the most trying cases, under peculiar circumstances—in the case of teeth that touch close to the gums: it is vulcanized rubber. I make wedges and file them so that they will stay between the teeth; they are non-absorbent, and remain perfectly sweet.

HOT WATER FOR HEMORRHAGE.

The excellent results I obtained with hot water in the practice of gynecology, led me to employ it in an obstinate case of hemorrhage after extracting. The result was very gratifying, and subsequent trials have invariably proved its efficacy. To illustrate:

At 2 P. M., I extracted the roots of a first lower molar for Mrs B. As is usual in such cases, it bled very little at the time. At eight that evening I was called to see her. Hemorrhage had set in several hours after she left the office. Mr. B. said she had "bled at least a gallon." (?) Ordered a quart of hot water, and with a Davidson syringe gently washed the wound until the water run away clear. There was no further hemorrhage.

In some few cases it may be necessary to repeat the application. I prefer a fountain syringe, hung about a foot above the patient's head. In bleeding from small blood vessels, and capillary oozing, I consider it one of the best hæmostatic agents at our command.

EUG. G. REGENNAS, D.D.S., Hope, Ind.

THE GERM THEORY.

Dr. C. T. Stockwell thus summarizes the germ theory of decay of the teeth:

First. The usual custom of testing for acids in the mouth by litmus paper is, to say the least, unreliable. Reaction upon litmus paper may show simply the presence of *harmless carbonic* acid in the saliva, when a careful chemical analysis may *fail* to show the presence of nascent acids that are capable of even *abrading* the teeth.

Second. The observations of the several microscopists agree in showing that in true caries the *organic* portions of the teeth, or protoplasmic fibrils, are first attacked by *various organisms*, and that their presence in the tubules and their branches is in advance of visible decay, thus destroying the *structure*, as the first step in the progress of caries.

Third. Chemical experiments show an *absence* of acids, and compounds of acids with lime-salts, except phosphates and carbonates, in the decayed masses, and that the lime-salts are *present* in substantial, normal proportions, excepting upon the *outer surface*, from whence they have been washed away, or removed by mechanical or other outside influences. Hence, no *solution*, relatively, of lime-salt. That when the teeth are acted upon by acids, an *abrasion*, simply, is the result. Acids acting upon a tooth produce *combinations* of lime-salts that are *neutral* or *inactive* in tooth destruction. For instance, acetic acid applied to a tooth produces, as the first result, *acetate of lime*, a perfectly harmless or neutral agent.

Fourth. The most potent remedy, or preventive treatment, is that which results the most effectively in the conservation and strengthening of the "vital forces" of the system. Topical remedies, to be most beneficial, should be antiseptic.

Fifth. The latest investigations in the three-fold field of histology, microscopy, and chemistry, point with surprising harmony to the *germ* theory as the most reasonable cause of dental caries. It explains more satisfactorily, and best harmonizes with the observations of phenomena of daily practice. It makes intelligible nature's resistant processes, such, for instanch, as Magitot's "zone of resistance." Lime-salt being much more easily soluble by the action of certain acids than the *organic* structure, it would seem a great blunder on the part of nature to fill up the tubuli with this material *if* acids were the attacking enemy.

Whereas, granting the claim that *germs* constitute the attacking forces, and that the protoplasmic fibrils are the points of attack, then nature seems to be "sound minded" in barricading with mineral substances the entrance to the tubuli.

Sixth. The same inference may be applied, with equal force, to the relative ease with which "soft" teeth are attacked, as compared with "hard" teeth. If the acid theory is true, "hard" teeth should succumb as readily as the "softer" structure—in fact, more readily. Whereas, if we accept the *germ* theory the unvarying opposite phenomenon is explainable. The vitality of a tooth is in its *organic* structure —not in its *lime-salts*—and if the vital conditions are unequal to the task of *building* solidly and strongly, the *defensive* quality of the structure is correspondingly weak, and yields to a much less vigorous attack of the common enemy.

SENSATION AND IMAGINATION.

BY GEORGE BEAVIS, ESQ., L.D.S.I.

I have recently met with a remarkable illustration of the production of sensation by ideas. I applied a paste containing arsenious acid to the pulp of an upper molar tooth for a young gentlemen of extremely nervous temperament. In a few days' time I removed the pulp, but hurt him considerably in doing so. I put a dressing of glycerin and carbolic acid up the largest canal, and saw him again in about a week; and directly I passed a nerve extractor up the root to remove the dressing, it appeared to give him great pain. As I was certain the whole of the pulp was out, I was at a loss to know what to do. I could not doubt his word, so I took a large plugger, that he would know was not intended to go up the root, and without him seeing me, I again passed the nerve extractor the whole length of the root, and he felt no pain. I then laid down the plugger, and let him see me take the extractor, and I *pretended* to pass it up the root, when he appeared to suffer exactly the same as when I removed the pulp. I am convinced he suffered or believed he did. I filled the tooth-roots and crown at the same sitting without further pain then or afterwards.—*British Journal of Dental Science.*

In preparing cavities in teeth, the amount of pain given depends much upon sharp instruments and quick motions. When your patient complains of being hurt by the removal of decay, just change your bur for a new one, and run your engine at double the speed you have been doing, pressing on but slightly, and see how much better you will do your work, and with how much less pain.

OXY-PHOSPHATE OF ZINC.

BY E. G. BETTY, D.D.S.

One of the most useful materials in the daily practice of the operator is the oxy-phosphate of zinc. So useful and reliable is it that it has quickly superceded the oxy-chloride, formerly so greatly in demand to meet the requirements of just such an article. As the material is comparatively new, and its manipulation somewhat different from that of the chloride, it may not be out of place to hazard a few suggestions in regard to its manipulation and uses. The properties depend, of course, upon the chemical process that takes place when the powder, oxide of zinc, and the solution of phosphorous acid, are mixed together. So far as the mixing of the oxy-phosphate is concerned, it may be laid down as a rule, that the powder is in all cases to be added to the solution. The required stiffness or flaccidity of the mixture is governed by the amount of powder added to the liquid. In very large cavities, not encroaching too near the pulp, when the intention is to fill with gold at the same sitting, it is desirable to guard against the shock of violent and sudden thermal changes. As a barrier between the metal and the dentine, it subserves a good purpose. Should the dentine be very sensitive the oxy-phosphate is better made stiff and quickly pressed into place with a suitable burnisher. When mixed stiff the affinities of the base and the acid are so nearly or completely satisfied that there does not remain upon the surface of the plastic bolus sufficient acid to produce the sudden and acute pain that so many patients complain of. This pain, which so many operators make the ground of their objection to the use of the oxy-phosphate, is due to two causes: First, when the material is made thin the acid predominates, and immediately attacks the sensitive surface of the dentine in the cavity. Second, even though the phosphate be made stiff, it may at the same time be so far below the tooth in temperature that, when introduced, it will cause pain by immediately absorbing heat from the tooth. This is reasonable to suppose, because the cavity is dry and the bolus (if it may be so termed,) is wet and of lower temperature. In the first instance the pain may be avoided, to a considerable degree, by previously lining the cavity with the dry powder. The thin mixture can then be placed in safely, the powder receiving and combining with the free acid, thus protecting the dentine. Should the cavity be in the upper jaw the thin mixture can, with little difficulty, be put in by first touching some interior point of the cavity with a small quantity of it. The bulk once touching this point of attraction will readily flow into place. If made thin the phosphate will necessarily require more time to set and become hard enough to withstand the percussion of the mallet. In the second case the materials ought to be prepared on a warm surface, to raise

the temperature of the mass near that of the tooth. This is simply done by mixing it on the bottom of a tumbler previously containing warm water, or upon a surface of glass or porcelain that has been warmed near the stove. The addition of heat to the mass, however, will hasten the setting, and it will be found necessary either to add less powder to the liquid, or be very, very expeditious in introducing it into the tooth. A little close observation will enable the operator to determine just the required consistency, and the rapidity of crystalization when mixed warm. The adhesion of the mass to the instruments while handling it is very annoying to those who are too lazy to slightly oil the instrument before using it. Instead of being an objection this very adhesiveness is a desirable quality, and often serves us well when the cavity is of poor retaining shape, and we wish to fill temporarily. In such cases the adhesion will be found greatest when the mass is mixed thin. For capping an exposed pulp successfully there is probably nothing better than the oxy-phosphate, if it is properly handled. In the estimation of the writer many failures are due to reckless excavation, and the consequent pain to which the pulp and surrounding dentine are subjected. The less pain attending the capping of the pulp the greater will be the chances of ultimate success. After the excavation is completed the pulp can be covered with a thin skin of gum by flowing over it a little of the compound tincture of benzoin. The walls of the cavity may also be coated with it, a time only being required for the evaporation of the alcohol. It may be expedited with the warm air current, gently and gradually applied. The covering of gum may be thickened, if desirable, by two or three applications of the tincture at short intervals. A small quantity of the phosphate may now be mixed thin, on a warmed surface, and placed directly over the exposure, allowing it to run over the edges so that it will bear upon the solid dentine. When hardened the capping may be trimmed with an excavator. The cavity can now with safety be filled as an ordinary one, without fear of producing pressure on the pulp. It is best to fill with a stiff bolus of the phosphate and allow it to remain for a year or more, as the material is good for that length of time in the majority of mouths; longer in some. By proceeding in the manner above detailed the operator will avoid producing that "shock" to the pulp which is caused either by placing in direct contact with it an irritating acid, or suddenly reducing its temperature. If the pulp is outraged by careless handling and its sensibility subjected to a severe trial, we cannot expect it to recover its wonted functions. It may not be generally known, but it is nevertheless a fact, that a violent toothache, due to an exposure, may be almost instantly controlled by an application of the compound tincture of benzoin. It was this fact that suggested to the writer the propriety of using it as a preliminary covering for the

pulp ; and experience has proved it very efficacious in many instances. It also serves very well when applied to the dentine over and around the pulp, during excavation, taking care not to flood the cavity with it while cold. The pledget of cotton saturated with it can be warmed over the lamp. The soothing effect of this tincture may be due, in some degree, to a slight anodyne property of some of its ingredients. It is probably more likely that its effect is owing to the evaporation of the alcohol, leaving a film of sticky gum that completely protects the surface from the atmosphere. Be that as it may, it is well worthy of a trial, and will not be found ungrateful.—*Ohio State Journal.*

ANAESTHETICS IN FRANCE.

Dr. Darin, is not of the opinion of those authors who say that nitrous oxide gas causes insensibility by asphyxia. He has seen plants and animals live in an atmosphere full of it. In practice its innocence seems proved ; out of 67,000 individuals anæsthetized by an Americrn surgeon, there had not been any case of death, nor had any occurred out of 300,000 cases published in the States. According to the reporter, the difficulty of obtaining a great quantity of laughing-gas, and the short time the anæsthesia lasts, have made it to be abandoned.

Dr. Perrin shared the opinion of Claude Bernard as to this gas. Its action is prompt as lightning, and the awakening so rapid when the inspiring instrument is withdrawn, that practitioners are obliged to apply the instruments beforehand. As to American observations, they must be accepted with a certain reserve. Horace Wells, after the first success obtained by experimenting on himself, was so hissed by the students on making his first public experiment that he gave it up and kept a menagerie. Since that, a statue has been raised to him. So

> The greatest legacy man can bequeath,
> Is a painless mode of extracting teeth,
>
> For aught that lessens human ill,
> And gives the patriot power and force,
> Aught that enlarges human skill,
> Must come from a supernal source.

THE wife of D. A. Radcliff, banker, died in a dentist's office in Dunville, Ontario, recently, while under the influence of chloroform, administered for the purpose of having teeth extracted.

DR. S. P. HASKELL, of Chicago, says:—It is strange how few dentists shape their plates and gums so as to restore the features, especially the expression arising from loss of the canine teeth.

No business can be sustained without promptness. Be careful how you make appointments, and then fulfil them.

GOLD FILLINGS.

Dr. J. J. PATRICK says:—So long as we are confined to the use of metals for filling material, there is no metal or combination of metals or subtances that has yet been found that can take the place of gold for that purpose. It possesses more of the valuable properties of the force of cohesion (hardness, elasticity, malleability, ductility, etc.,) than any other metal; it is capable of receiving and retaining additional powers of cohesion by the application of coercive force; and when combined with small quantities of its sister-metal, platinum, its hardness and elasticity are greatly enhanced by the joint action of adhesion and cohesion; in fact, the force of cohesion in gold is so powerful that at ordinary temperatures it will unite under coercive force almost equally as well as iron or platinum under the influence of heat. Like platinum, it is not influenced by any single acid or alkali; it does not tarnish in moist or dry atmosphere at any temperature, and is not affected by sulphur, iodine, or phosphorus.

DR. J. M. HURTT, of Peoria, says:—In studying the disposition and general physical "make-up" of man, in connection with his teeth, with regard to the manufacture of artificial dentures, I find six general outlines as indicative of certain characteristics, theoretically, subject only to modifications in gestation, education, and culture, with heredity:

1st. Those teeth that naturally curve from the gum margin toward the center of the mouth, represent the penurious disposition.

2d. Those that protrude towards the lips and cheeks, the inquisitive disposition.

3d. Those that are vertical, or having a slightly outward slant, represent the even tempered.

4th. Those having a horseshoe curve from molar to molar, around the grinding and cutting surfaces, the fleshy and jolly.

5th. Those nearly in a straight line from cuspid to cuspid, and thence to last molar, having the cuspids prominent, indicate angularity of disposition and features, and a slender body and face.

6th. An easy oval between the round and angular, indicate full habit and evenly balanced organization.

Of course all these are types of principles, and perhaps at first we would say subject to so many modifications as to ruin the rule. There is much to say on this point; as, for instance, penurious and inquisitive dispositions found in the same character in a marked degree, would indicate protrusion of one set, and inward inclination of the other, and various modifications of the different classes, needing careful elimination, that I forbear, lest these few remarks become a dessertation.

SULPHUR, IODINE AND PHOSPHORUS.

BY DR. JOHN J. R. PATRICK.

SULPHUR.

There is no other element so widely distributed in the animal, vegetable and mineral kingdoms as sulphur. Nature employs it in most of her operations. She presents it under many forms among fossils; charges with it the water known as sulphurous; mineralizes with it most of the metals forming iron pyrites, galena, cinnabar blende, and silver glance; causes it to pass into the vegetable and animal fibers, and forms an infinite number of combinations with the earths. Sulphur is present in horse-radish, cresses, and many other vegetables, and is a constituent of the volatile oils of mustard, garlic and assafœtida, and of albumen and other proteids. It is always evolved, in combination with hydrogen, from animal substances during their putrefaction; and the change which silver undergoes when immersed in mustard or an egg shows the presence of sulphur, and the strong affinity it has for that metal. When taken into the system with food, or exhibited as a medicine, it penetrates to the extremities of the most minute vessels, and impregnates all the secretions. It shows a tendency to unite with mercury equally as strong as its affinity for metallic silver, for there are instances on record of persons having been subjected to mercurial medicine for a short time, and upon the outward application of sulphur ointment for a few hours, the spot where the ointment was applied became quite black. This was occasioned by the mercury exuding through the pores of the skin to unite with the sulphur, in consequence of its affinity for that substance, and a true ethiops-mineral was formed. A beautiful illustration of this principle is shown in one process of parting gold and silver: The silver being in excess, the two metals are melted and rolled into thin plates; then a layer of sulphur and a plate are alternately disposed, whereupon the sulphur unites with the silver, forming a sulphuret of silver in the form of a black powder, which is washed out, leaving the gold in a spongy condition, but pure. Sulphur does not unite with metallic gold or platinum, but it will form an auric sulphide when united with the cyanide of gold.

IODINE.

Iodine, next to sulphur, is one of the most widely diffused of elementary bodies. It vaporizes at the ordinary temperatures; it is found in some minerals combined with mercury and silver; unites readily with the different salts, but enters into combination directly with metallic mercury, silver, tin, copper and zinc, forming the iodides of these metals. Aside from its natural presence in the system, it is used largely as a therapeutic agent (stimulant, absorbent, emmenagogue and alterative). From its known affinity for mercury, it is

not used in collutories for relieving mercurial sore mouth; and in cases of chronic mercurial poisoning the administration of iodine furnishes the most effective means of eliminating mercury from the system, thereby curing paralysis, neuralgia, and other symptoms of poisoning from this metal, for all soluble salts of mercury are poisonous.

PHOSPHORUS.

This non-metallic element is widely diffused; it enters largely into combination with the oxide of calcium (lime) and magnesium in the formation of bone; and in the dentine of the human teeth the phosphate of lime and magnesia constitute 63 per cent., and in the enamel 86 per cent. Phosphorus unites readily with metallic salts, and unites slowly with metallic silver, mercury, tin, copper, and zinc, but it will not unite with metallic gold or platinum.

THE *Independent Practitioner* says that, "Mr. William J. Thulman, a druggist of Buffalo, recently came to his death from a singular cause. While eating his dinner a large amalgam filling in one of his teeth became detached, and was swallowed. He immediately expressed his apprehensions of trouble from it, but felt no special inconvenience for some days, when he began to experience pain in the abdominal region. The symptoms became aggravated, peritonitis ensued, and he finally died, after much suffering. An autopsy was held by prominent physicians, when it was found that the irregularly shaped mass had lodged in one of the lower folds of the ilium, and had produced an ulcer, which had eaten its way through the intestines, and finally caused his death."

One of the "prominent physicians" who was present at the autopsy, says, that neither an "irregularly shaped mass," or anything that looked like an amalgam filling was found, although diligent search was made. We are inclined to think that the conclusions in the case are not warranted by the facts.—*Ed. Dental News.*

[We should think it possible that "an irregularly shaped mass" of any hard substance, "lodged in one of the lower folds of the ilium," would produce such irritation as to end in sluffing of the membrane, and possible death, though nature usually guards against such serious consequences, by causing this very irritation to produce a tough wall around the foreign substance, and thus prevent it from doing harm. Leaden bullets, which are poisonous, lodged in different substances of the body, are thus protected or incysted.

That the mercury of the amalgam had anything to do with the "ulcer" is quite improbable. We have had, as undoubtedly most dentists have, many a patient swallow large, fresh amalgam fillings with their food—actually chewing them up while yet soft—without ever hearing of evil results.—ED. ITMES.]

THEORIES OF DECAY.

An interesting discussion in the New York Odontological Society, occasioned by Dr. F. Y. Clark's Essay on Bacteria.

Dr. Frank Abbott. It has been my fortune, within the last three or four years, to examine a great many teeth; not only carious teeth, but also those in a comparatively good condition. In the paper which I read before this society a little over two years ago, upon "Caries of Human Teeth," I stated very positively, and I am ready to reiterate the statement now, that what Dr. Clarke terms bacteria, leptothrix, or micrococci, are found in the mouth in tartar, in decomposing food, and upon the teeth.

Dr. Clarke. I have not stated that leptothrix, bacteria, or micrococci are the same. I call them distinct.

Dr. Abbott. I understand that. You might see millions of micrococci in one specimen, but bacteria proper are not found in decaying teeth, that is, in the decayed substance itself. They are found in the food, and about the teeth. Leptothrix are also found in large quantities in decaying teeth, but it has never been shown in this country (and I believe we have made as careful examinations as have been made anywhere) that these organisms play any part in the decay of the teeth. They are simply organisms which present themselves in large numbers and thrive as soon as decomposition of the tooth-substance begins. In ulceration of the mucous membrane of the mouth, you find the same thing. I think I have shown very conclusively that decay of the teeth first begins by a dissolution of the lime-salts by an acid, and the moment the living matter in the tooth is exposed, there is an irritation set up which penetrates the tooth-structure, sometimes to, and even beyond, the pulp itself, when only a very small portion of the tooth is destroyed. The doctor speaks of the solidification of the tubuli; that is the same theory advanced by Tomes years ago. He evidently mistakes a partial decalcification for solidification. Under a low power all specimens of carious teeth present that appearance. On the other hand, if you raise the power, and have your specimens thin enough, you observe that these conditions are the various stages of decalcification and absolute inflammatory reaction. No leptothrix or micrococci are found, excepting where decomposition of the tissue has commenced. The acid condition that exists at the bottom of a cavity, where the partially decalcified tooth-substance is necessarily left in many cases before filling, can be neutralized by coating that portion of the cavity with precipitated chalk. It may be used either dry, or mixed with creosote; if used with creosote, the antiseptic effect of that substance is also obtained, which possibly may be desirable. To Dr. C. E. Francis, of this city, is due the credit of suggesting the use of chalk for this

purpose. I have used it a great many times with happy results. As far as the mercury in amalgam is concerned, I should rather doubt the possibility of its having much effect one way or the other. If a tooth is hermetically sealed by the filling, the partially-decalcified portion becomes recalcified,—so much so, that often that portion of the tooth appears to contain more lime-salts than even normal dentine. This process of recalcification sometimes takes place where no filling has been done; decalcification stops, the inflammatory process subsides, and a re-deposition of lime-salts takes place.

Dr. Clarke. I feel too deeply interested in this subject to let pass what has just been said without a word or two in refutation. For many years I have given this matter considerable attention and investigation and I can assert most positively that the chemical or lime-and-acid theory is incorrect. Beale, Huxley, Tyndall, and Cohn are authority as to bioplasm and diseased germs. They have most positively proved that nearly every disease that flesh is heir to is caused by bacteria or diseased bioplasms. It is folly to say that these eminent observers are deluded simply because one cannot in a few hours, through a pocket or ordinary microscope, see all that has been decribed by them. According to this there would be no contagion or infection, and we could breathe infected air and handle infected matter with impunity. The lime-and-acid theory—to the uninitiated—in some respects is very pretty and plausible, but in practice is a failure. If it is correct in theory that caries is produced by an acid, why not act upon it in practice, and neutralize the acid with an alkali? In cases where there is danger of pulp-exposure, why not free the carious dentine with chalk, as you say you can, and leave the layer of decay as a capping? You know by experience that it will not do. You would lose your teeth and practice too. This has been often tried long ago, and found no apparent value. How is it that teeth decay in mouths where no trace of acid is found, but where the fluids are alkaline? Does that which prevents, initiate decay? Again, if decay is caused by an acid in the saliva, why are not all surfaces attacked alike? Fermentation must, and does take place in all pits, fissues, uneven and unmolested localities, and thus bacteria are developed. It is true that the acids thus generated may, to some extent, attack the lime of the tooth, but that it is the real cause of caries, most emphatically, *no!* As stated in my paper, it is impossible to account for all the different shades of caries on the acid theory. Acid does not and cannot produce them.

Dr. Abbott. There is probably not a man within hearing of my voice who will state that he removes all abnormal tooth-structure from teeth before he fills them, under all circumstances. If he does, he has a good time of it, and his patients are to be pitied. There is not one tooth in ten that is filled where this is done. All traces of decay are

probably not removed from any of them. There possibly may be exceptions. I have seen traces of decay penetrating to and even beyond the pulp-chamber, where the cavity proper was not half the size of a pin's head. You must stop your excavations somewhere, and it is usually short of removing all abnormal tooth-substance. I know I do. I know every other man does who has the health and comfort of his patients at heart. The partially-decalcified portion usually left under fillings presents, under the microscope, that peculiar yellow stain imparted to organic material by chromic acid, showing very plainly that the glue-giving basis-substance has become liquefied, and the lime-salts dislodged. Under low powers the specimen presents a granular appearance, but high powers show the inflammatory condition of the living matter.

Dr. Bodecker. I have been cutting and examining a great many teeth, both normal and decayed, but a ralcification of the dentine I have only seen twice. I have two specimens, and I believe these are the only two that have been seen in Dr. Heitzmann's laboratory. I regard them as exceptional cases. If it were not so, Dr. Abbott, as well as I, would have seen more of them. In one of the two specimens, which was cut from the neck of a tooth, I remember distinctly no decay was perceptible. The neck of a tooth is quite characteristic, showing spindle-shaped protoplasmic bodies in the cementum, with the canaliculi of the dentine stopping short of the latter. These spindles had disappeared, and instead of them recalcified dentine was present. That this dentine is a secondary formation, I am sure, because primary dentine and cementum exhibit a different appearance from recalcified dentine or cementum. The number of dentinal canaliculi is much less than in normal dentine; they are generally wavy and irregular, and the basis-substance looks entirely different from that in primary structure. With regard to the germ theory, I believe we are somewhat in the dark yet. An eminent writer of Europe, whose name I have forgotten, quite recently has published extraordinary statements. He has observed leptothrix flourishing upon crystals of carbolic acid. He is opposed to Lister, who some years ago adopted the use of an aqueous solution of carbolic acid, in the form of a spray, for surgical operations. Great wonders have been done by its use, and yet some surgeons to-day say, that the beneficial result is not to be attributed so much to the use of Lister's spray, as to cleanliness. This is a thing not at all settled. I have been for over six years in the habit of disinfecting every cavity, previous to filling, with a solution of carbolic acid. If it is far enough from the pulp, I take the crystals, but if it is near the pulp I use about a five to ten per cent. solution in water, for it is dangerous to bring the concentrated carbolic acid near the pulp when exposed.

Dr. Clarke. I know the writer of whom you speak never saw lep-

tothrix on carbolic acid, unless on the pure crystals at a low temperature. They cannot exist on carbolic acid in a fluid state.

Dr. Bodecker. Carbolic acid has played a very important part in this connection, but we do not know whether it is carbolic acid or cleanliness.

Dr. Bogue. For my information, let me ask Dr. Bodecker his meaning. He spoke of secondary dentine, but did he mean a secondary deposit in the dentinal tubuli? Did I understand that was seen but twice?

Dr. Bodecker. Yes, sir; once in a cavity that had decayed, and once in the neck of a tooth where there had been no previous decay whatever.

Dr. Bogue. Of course you have examined teeth that have been worn off by tobacco-chewing. Has it not been seen in those cases?

Dr. Bodecker. I have not seen many of them. They generally presented a discoloration, but no recalcification.

Dr. Bogue. I am greatly surprised and interested, and I do not undertake at this moment to combat the testimony. The filing that was once so freely done, certainly produced a changed appearance of the surface, and the teeth which underwent that process presented a very different appearance a few years later. To all appearance, some of them are as polished as if they had been carefully polished at the time. I have in mind a lady whose dentist cut out the lower molar cavities; she has entreated me to fill them, but I have declined. There is no decay to be seen, and those places, while dark, are polished and bright.

Dr. Abbott. Cleanliness is the secret.

Dr. Bogue. I have no doubt of it, but I supposed, and I shall be astonished if it is not so, that the dentinal tubuli were filled up by a deposit of lime-salts.

Dr. Abbott. That possibly may be the case, but I am of the opinion that it is recalcification after partial decalcification, and that the structure of that portion of the tooth is changed very much from its original condition, *i. e.*, it shows a secondary formation of dentine.

Dr. J. W. Clowes. The philosophers of this country and Europe have been very busy of late in straining their eyes to discover, per microscope the ossivorous bacteria and festive leptothrix. Of course they have been found and their habits noted, and now we are told a cock-eyed fellow of browsing proclivities has appeared upon the scene and is vigorously disposing of the dentinal herbage, and making a brave struggle for existence. What are we coming to, if this raiding upon personal property is not stopped? Not a tooth will be left us if these imps of destruction are not muzzled and a check placed upon their rapacity. I have diligently searched for the leptothrix, and hoped to

find him in his moments of festivity, but, blister my eyes as I may, the effort thus far has been fruitless. The aforesaid philosophers have amused themselves vastly, and their enjoyment has been full. Seeing by faith alone, we have partaken of their joys until we are full also, and as common-sense professionals are tired of amusement. *We are sickened by the nonsense which attributes dental decay to the action of microscopic tigers and wolves.*

The cause of decay has long been understood; it is no secret to those of sense possessed, and is *shown by the simple chemical experiment* of *immersing an egg in vinegar.* This will tell the whole story. Did you ever try this experiment? Do so, and you will, in a few hours, ask what has become of the *lime that was in the shell? The acid of the vinegar has dissolved it, and nothing but its cartilaginous portion remains.* Dental decay is the dissolution of lime-salts by the presence of an acid, and the progress of decay is according to the measure of its strength.

Dr. Clarke. The *germs* of the vinegar produce the change.

Dr. Clowes. If the *wigglers* inhabiting that acetic territory are equal to that, their teeth are better than ours.

Dr. Abbott. You have the egg left after the action upon the lime-salts?

Dr. Clowes. The egg still remains; the lime only has been disclosed and is held in suspension by the vinegar. I declared to this society, years ago, *that teeth are but organized lumps of lime, and acids are their affinity and their solvent.* This is the whole story in brief: Whenever an acid comes in contact with a lime body, the affinities are such that the lime succumbs to the acid. You may look through all the woods, ravines, and mountain ranges of the dental continents, and these severely-hunted animals will be found entirely harmless and non-destructive, *living, moving, and having their being because of favoring conditions, and not producing these conditions.* Dr. Abbott says acid-effects are arrested by prepared chalk; this is because chalk is antacid. It neutralizes the cause of decay, and decay must then stop. Chalk is a great preservative to place around and among the teeth. Without prepared chalk, no tooth-powder would be of any real value. Our friend wishes to know how decaying teeth were saved by filing, and in what way the processes of decay were arrested. *When in contact, the teeth caught and retained foreign matter, which, when acidified, produced decay; when separated properly, the reteniion of said matter ceased, and the cause of decay passed away by a healthful disturbance in the act of eating.* Separating skilfully always arrests decay, and, if done early enough, entirely prevents it.

Dr. Clarke. If, as has been stated by Dr. Clowes, the teeth are nothing more than lumps of lime, then the fluids of the mouth would

dissolve them as rapidly as water dissolves lumps of lime out of the mouth. His so-called "browser," or "cock-eye," would have no time for hunting about through dental ravines, woods and mountains. Whole sets of teeth would be eaten up and demolished in one general assault. You are advised to try the old egg-shell experiment, by placing an egg in vinegar; place with it a decayed tooth, and see if you can produce the same changes which are produced in the mouth.

Dr. Clowes. Decay, when produced by a direct or highly acute acid, is very white; the enamel and dentine are not only softened but bleached by it, and its progress is very rapid. Decay, from dilute acids or the gradual decomposition of food, at first has no color, but assumes a brownish tinge as each successive layer of softened bone is exposed to the air. We understand this very well; we should be very obtuse, intellectually, if we did not.

Dr. Abbott. In reference to the pigmentation the doctor speaks of, it will be remembered that, in my paper before referred to, I spoke very particularly of the discoloration of decaying teeth, and stated that those teeth which decayed very slowly indeed were those which were discolored the most. "The slower the decay, the more the discoloration; the more rapid the decay, the less the discoloration." Where this pigment comes from, we do not pretend to say, but that it is contained in the organic substance of the tooth, there can, in my opinion, be no question, from the fact that the lime-salts could not contain it, and furthermore, you may dissolve the lime-salts entirely out, and have the discoloration still remaining.

AN EXCELLENT METHOD OF TREATING RUBBER DAM.

After the piece is prepared for the mouth, both surfaces near the punched holes should be sprinkled with powdered soap-stone and well rubbed in by hand. The stone, as prepared for the shoe trade, known as "Paris chalk," is a good article, and it may be scented with something to disguise the sulphurous odor of the rubber that is so disagreeable to some patients. The rubber thus prepared will more readily pass between teeth that closely proximate than that as ordinarily used. It will be found that the rubber prepared in this way will not tear as easily about the apertures in application to and removal from teeth. A piece of rubber lasts much longer treated this way.

In cases where a series of operations at short intervals between the sittings makes it expedient, for the sake of economy, to use the same piece repeatedly upon a patient, the use of this soap-stone after washing and drying before laying it away will keep the piece soft and fresh. All kinds of rubber dam should be kept in a *very dark, cool place.*—*New England Journal of Dentistry.*

Scientific.

HUMAN PHYSIOLOGY.

BY L. ASHLEY FAUGHT, D.D.S.

Formerly Lecturer on Physiology in the Philadelphia Dental College.

(CONTINUED FROM PAGE 82.)

The earliest changes that will ultimately result in the formation of a tooth, are observable at about the fortieth or forty-fifth day of utero-gestation. A slight, rounded depression appears in the situation of the future alveolar ridge. Its elevated borders consist of a deposition of those minute cells which form the covering of many animal membranes (epithelium), and a transverse section of it exhibits a club-shaped duplication of epithelium, dipping into submucous tissue. This epithelial infolding becomes enlarged at a later period, and assumes the shape of a Florence flask, indented slightly in the base. Situated beneath, and rising into this indentation, is a portion of the sub-mucous tissue—the future dentine germ. Arranged around the sides of the flask-shaped body, as a lining, are columnar epithelium cells, while the central space is filled with other cells, which are shaped like stars (stellate), and whose function seems to be simply to occupy that space. All of this structure described is the enamel-organ, and from it is formed the future enamel of the tooth; the columnar epithelium cells becoming converted into the enamel prisms, and assuming a hexagonal shape from the pressure caused by apposition. From the dentinal cells (odontoblast) of the dentine-germ is formed the dentine. The free edges of this germ extend up around the enamel-organ, in that vascular arrangement—the tooth-sac, which subsequently becomes the alveolar dental membrane, and from it is formed the cementum.

This description of the development of the temporary teeth is also substantially that of the permanent, the germs of which bud off from the "necks" of the enamel-organs of the temporary teeth.

The calcification of the dentine begins before that of the enamel, and takes place from without, inward; the calcareous matter being deposited first in the periphery of the dentinal cells (odontoblasts), then a layer added to this and so on towards their centers, where, by limitation the process is arrested, and the uncalcified portion becomes the dentinal fibrili. In like manner, the calcification of the cells is stopped, and those remaining uncalcified constitute the dentinal pulp.

The outer layer of dentinal cells (odontoblasts) in the dentinal pulp is the ivory membrane (membrana eboris).

The enamel is formed from within, outward, deposition being made first in the periphery of the cells, and then layer on layer toward their centers, which are kept open for the conveyance of material up through the formed enamel prism, to the uncalcified portion of the cell above. These centers are not closed until the sides of the prisms are calcified throughout their entire length. The material used in the calcification of the enamel is obtained not only from within but also from without, through the agency of the "neck" of the enamel-organ, for we find the finished enamel hardest externally.

The teeth erupt according to the following tables:

DECIDUOUS SET.

4	incisors	(central)	erupt between	5th and 8th months.
4	"	(lateral)	"	7th and 10th "
4	canines		"	12th and 16th "
8	molars		"	14th and 36th "

PERMANENT SET.

4	incisors	(central)	erupt between	6th and 8th years.
4	"	(lateral)	"	7th and 9th "
4	canines		"	11th and 12th "
4	bicuspids	(first)	"	9th and 10th "
4	"	(second)	"	10th and 11th "
4	molars	(first)	"	5th and 6th "
4	"	(second)	"	12th and 14th "
4	"	(third)	"	17th and 25th "

The lower teeth generally precede the upper by a few weeks.

The absorption of the roots of the temporary teeth may be considered a retrograde metamorphosis. Having served their function, the nourishment is cut off, and they are slowly removed from the organism.

Having considered the principal passive organs, it remains to notice those from which these acquire motion by reason of their connection —the upper and lower jaw-bones (superior and inferior maxillæ).

The upper jaw-bone (superior maxillary) are irregular in shape, and each exhibits a body, with nasal, palatal, malar, and alveolar processes. The palatal process is a horizontal plate of bone which forms the roof of the mouth, and is connected with the superior teeth. The upper jaw-bones have no motion independent of the skull.

The lower jaw-bones (inferior maxilla) consists of a horizontal portion, convexed anteriorly—the body—and two perpendicular quadrate plates (rami) ascending from the posterior extremities of the body. At the median line of the body is a ridge—the symphysis—where join the

two parts in which the bone is developed. The internal surface is marked by four genial tubercles. Each ramus has two prominent processes above. One, the condyloid process, is short and thick, and articulates with the temporal bone; the other, situated anteriorly to the first-mentioned, is flat, thin, and triangular. Between them is the semilunar notch (sigmoid). The juncture of the rami with the body of the bone is called the angle, and is nearly a right angle in adult life. In old age, and in early infancy, it is inclined to be acute.

The difference in the articulation of the lower jaw with the upper, in lower animals, has already been referred to. It is also invested with peculiarities in man. In him it admits not only of up and down, but also of considerable lateral motion. Between the condyloid process and the glenoid fossa is an inter-articular disc of fibro-cartilage. This aids in the sliding motion of the lower jaw. These movements are accomplished by the agency of fibrous bands, masticatory muscles, passing to it from fixed points.

For convenience of study these muscles can be tabulated as follows. In naming the attachments the origin is mentioned first:

MUSCLES OF MASTICATION.

Muscles which depress the lower jaw.

MUSCLE.	ATTACHMENTS.
DIGASTRIC (two bellied).	Digastric groove of the temporal bone.—Digastric fossa of the lower jaw, near the symphysis, with its central tendon held to the lingual bone (hyoid).
MYLO-HYOID.	Body of the hyoid bone.—Mylo-hyoid ridge.
GENIO-HYOID.	Body of the hyoid bone.—Inferior genial tubercle of the lower jaw.
PLATYSMA MYOID.	From subcutaneous connective tissue, and from fascia over pectoral, deltoid, and trapezius muscles.—Anterior half of the body of the lower jaw.

Muscles which elevate the lower jaw, and move it laterally and antero-posteriorly.

TEMPORAL.	Temporal fossa and temporal aponeurosis.—Coronoid process of the lower jaw.
MASSETER.	The zygomatic arch and malar bone.—Lower half of the ramus and the outer portion of the angle of the lower jaw.
INTERNAL PTERYGOID.	Pterygoid fossa.—Inner side of the ramus, and angle of the lower jaw.
EXTERNAL PTERYGOID.	Pterygoid ridge of the sphenoid, external pterygoid plate, and the tuberosity of the palate and the superior maxillary bone.—Inner surface of the neck of the condyle of the lower jaw, and the inter-articular fibro-cartilage.

A careful study of this table will make it evident that the second

division, "the muscles which elevate, etc.," is the most important to the physiologist; for, while those which depress aid in the downward movement of the mandible or retard its upward motion, these, in addition to the possession of the reverse of those movements, are also the main source of the power used in comminuting food. Their anatomy gives a clear idea of their action. The temporal, masseter, and internal pterygoid are chiefly concerned in closing the jaws. The position of the attachments of the internal and external pterygoids are such, that by alternate action the lower jaw can be moved laterally. Its movement in an antero-posterior direction is accomplished not alone by the levattor muscles, but by a union of them in action with some of the depressor group. Motion forward is produced by the pterygoids, the oblique fibers of the masseter, and the anterior fibers of the temporal; backward, by the posterior fibers of the temporal, the digastric, mylo-hyoid, and the genio-hyoid. The movement backward is more a return to a normal position than a direct displacement from a state of rest.

In the act of chewing, the food has a constant tendency to escape from between the teeth. This is partly prevented, and the portion that does, is constantly replaced by the action of the lips, cheek, and tongue. The lips play also an important part in the retention of fluids within the mouth.

The tongue claims special consideration on account of its great variety of important movements. It is essentially a muscular organ. The outward (extrinsic) muscles produce its movements in various directions, while any change in form is assumed through the action of the inward (intrinsic) muscles. This organ is a symetrical structure, built upon either side of a fibro-cellular division, and is attached at its base to the hyoid bone. A cortical and medullary portion is presented for study. The principal muscles in it are the genio-hyo-glossus, hyoglossus, lingualis, stylo-glossus, and the palato-glossus. By these, and others acting in combination, the movements used in suction, phonation, mastication, and deglutition are produced.

Insalivation, or the thorough incorporation of the food with saliva, is one of the most important digestive processes taking place in the mouth. The saliva exerts a twofold influence, which may be expressed by the term mechanico-chemical. The mechanical function of it is to reduce the food to a state convenient for swallowing; while its chemical importance is made manifest by the grave symptoms of impaired nutrition, which follow its loss in great quantity. These symptoms are not infrequently the result of an acquired habit of spitting—a practice to be greatly deprecated. Nature does not pour in so large a quantity this highly valuable fluid into the alimentary canal, at so

high a point, for voidance, every evidence being that it is to be used by the economy.

The saliva is a compound fluid, composed of the secretions of four different glandular organs, viz.: the parotid, the sub-maxillary, and the sub-lingual glands, salivary strictly in nature; together with the muciparious glands of the mouth and fauces, including the labial and buccal glands, and the follicular glands of the tongue. As most of these glands essentially resemble each other in their structure, only a general consideration of them is appended. They belong to the variety of glands called racemose, a full description of which will be given under the head of secretion. Being made up of a number of lobules attached to a common duct, each of these lobules is penetrated by a corresponding terminal branch of it, which there divides into smaller tubes, each one of which finally terminates in a rounded sac, called a glandular follicle. These follicles are lined by glandular epithelium cells, which, in modified form, line also the ducts. The epithelium of the ducts, as well as of the follicles, according to Pfluger, are active agents in the process of secretion.

(TO BE CONTINUED.)

THE MINUTE SIZE OF GERMS.

It is altogether beyond the power of the mind to conceive the minute size of some of the germs which in their subsequent development work such wondrous changes, and which have such important influences on health and several industrial processes. We read of the experiments of Pasteur, Tyndall, and others, but we seldom realize the infinitely small size of the organisms and germs referred to, for some are undoubtedly so minute that the most powerful microscope fails to detect them, There are some interesting remarks on this subject in a recent number of *Knowledge*, which we quote: "The minute organisms capable of inducing changes analogous to the fermentation caused by yeast, have received great attention of late years, and several important diseases are distinctly traced to them. Bechamp estimated that eight thousand millions of germs of one micro-ferment only occupied one cubic twenty-fifth of an inch. Not one of these minute bodies could develop. except by carrying on complicated processes of a chemical nature, involving very active movements of its atoms and molecules."

The mathematicians have made calculations founded on the pressure exerted by the gases, and other considerations, which show that a particle of the sort of matter, such as albumen and protoplasm, chiefly concerned in life processes, contain in a space of one cubic thousandth of an inch, more molecules than any one could possibly form any con-

ception of. Sorby, taking a probable mean of such calculations, supposes one cubic thousandth of an inch of water to contain 3,700,000,000,000 molecules. A sheet of ordinary note paper is about one-hundredth of an inch thick. One-tenth of this would, of course, be one-thousandth of an inch; and a little square box of that size each way would hold the amazing number of water molecules mentioned. Perhaps a few thousand of such molecules may suffice for some manifestation of life, but even if many millions should be requisite for the structure of the humblest and simplest germ, we could never expect to see the actual beginning of life.—*Scientific American.*

OZONE.

Ozone is an *allotropic* form of O, (Oxygen)—*i. e.*, a form in which the element itself is so changed as to have new properties.

It is always perceived during the working of an electric machine, and is then called "the electric smell." It has also been detected near objects just struck by lightning. Electricity is supposed to have something to do with the formation of the ozone in the atmosphere.

To prepare it, pour a little ether into a jar of common air, and stir in its vapor a heated glass rod. The O will immediately change into its allotropic form—ozone—which can be recognixed by its pungent odor. It may also be tested by a paper wet with a mixture of starch and potassium iodide (KI). The ozone sets free the iodine, which unites with the starch, forming blue iodide of starch.* At a temperature a little above that of boiling water, the ozone will turn into O.

Ozone is still more corrosive than oxygen. It bleaches powerfully, and is a rapid disinfectant. A piece of tainted meat plunged into a jar of it is instantly deodorized, and it is probable that, even in minute quantities, this gas exercises a powerful influence in purifying the atmosphere. Its over-abundance in the air is supposed to produce influenzas, diseases of the lungs, etc., and its absence to cause fevers, agues, and kindred diseases.

Antozone (the opposite of ozone) is always formed at the same time as ozone, but returns to ordinary O more readily. Its distinguishing trait is its tendency to form clouds with O. We notice it in the oxidation of phosphorus, as a white mist which remains long after the phosphorous oxides have been dissolved by the H_2O (water). The gray smoke that lingers around chimneys, steam-engines etc., is composed of antozone.—J. D. STEELE, M.D.

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* If a piece of the dry iodized paper be exposed upon a clear day in the open air of the country, in a few minutes it will assume a bluish tint. In cloudy, foggy weather, or in cities, this effect is rarely observed.

EFFECTS OF INHALING OXYGEN.

A young Frenchman, M. Aune, has lately made experiments on himself relative to this question, which he has chosen as the subject of a medical thesis. The experiments lasted four weeks, during which time he submitted himself to a uniform *regime* as regards quantity and quality of food, muscular exercise, and intellectual work. He took oxygen only during the second and the third week, inhaling between forty and eighty liters of it daily, but during the whole time he made a careful record of temperature, pulse, respiration, etc. The conclusions arrived at are briefly as follows: Inhalation of oxygen made under physiological conditions do not cause any inconvenience. One may absorb one hundred liters, and even more, daily. Oxygen increases the appetite and develops the functions of assimilation; and on this account it tends to increase the weight of the body. It produces a slight intoxication and tingling sensations in the extremities. It raises the temperature very slightly. Under its influence the respiratory movements and the pulsations become more numerous. The emission and secretion of the urine are not effected, nor is its constitution. Oxygen has an incontestable action on certain elements of the blood; it increases the number of red corpuscles and of hematoblasts, and the richness of the former in hemoglobin. It has no influence on the white corpuscles. M. Aune did not experience that sensation of heat in the chest, of which some authors have spoken in connection with this subject. Commenting on M. Aune's experiments, M. Hoyem remarks that the effects are only temporary, and that while inhalation of oxygen may be of service through favoring assimilation, it could not be made a definite treatment, and it would be necessary always to administer iron in addition. The inhalation gives very good results in the case of dyspeptic pneumonia and obstinate vomiting.

[We have often administered nitrous oxide gas as a tonic, especially for affections of the lungs, and with uniform good results. We have attributed these favorable results from its being so rich in oxygen.—Ed.]

The Weight of Air.—We all know that air has weight, but we are apt to have rather vague ideas as to the weight of comparatively limited quantities of it. 13 cubic feet weigh one pound. About 65 cubic feet of air furnish 1 pound of oxygen. An apartment 8 feet high, 12 feet wide, and 13 feet long, contains about 100 pounds of air; and a room 40 feet square and 18 feet high contains about a ton.—*Boston Journal of Chemistry.*

L. F. Sheppard, D.D.S., of Centralia, Ill., has been the preceptor of ten students, who are now noted dental practitioners. This is almost as prolific as the celebrated laboratory of Drs. Watt and Taft.

Miscellaneous Editorial.

THE ART OF THINKING.

All of us have good thoughts, but with many of us they are neglected and in confusion—inextricably mixed and entangled with too many worthless and evil thoughts, which prevent healthy growth, maturity and fruitage in those that are good.

The art of thinking is the art of selecting the fittest, and rejecting the multitude of the useless and vicious, which are ever crowding themselves upon us—and not only selecting, but maturing and using them to the greatest advantage. We can have even too many good thoughts, as we can read too many good books, giving too little specific attention to any of them.

It is the art of thinking well which gives such preeminence to some. They may have no better thoughts than the rest of us, but they take better care of them. While our good thoughts die for the want of nourishment, or grow up wild and barren—nothing but leaves and ungainly, sprawling limbs, choking and entangling each other in their useless multiplicity—*their* thoughts are selected and arranged, nurtured and cultivated, and finally brought forth fruit in their perfection—beautiful, fragrant, luscious—the praise of all the earth.

Thinking is not left to our choice. We cannot help it. As the soil must bring forth something, so our minds are compelled to produce thoughts—weeds if not plants, bush if not trees, leaves if not fruit. Fortunate is it if a neglected mind does not go farther astray, and bring forth poison.

If, therefore, we are so constituted that we must think, our only choice is in determining what our thoughts shall be, and what we shall do with them. And, as in the wilderness we find some good trees and fruitful vines, in spite of the many which are useless, so, though our thoughts may be allowed to take their own course, we shall have, here and there, a stunted growth of wild fruit, which shall redound somewhat to the world's good. To get our food and clothing, we must produce something that shall be accepted as fruit, though it be poor in comparison with what it might have been. It is taken as better than nothing, and we are allowed to live.

Shall our thoughts be thus like the uncultivated wilderness, or shall they be like the well-kept farm?—good seed sown in its proper season, and with regularity, with adaptation to soil and our greatest needs, and all done with reference to definite results.

The art of thinking requires concentration of effort, method of de-

tail and continuity of purpose. Thoughtfulness must be so persisted in as to become habitual, and this habit so absorbing as to create an inner world—a grand world of our own, in which we are the ruler, and all our thoughts are our good and obedient subjects.

THE SWEET AND THE SOUR.

There are those who look so sweet and attractive we can but like them; there are others who appear so sour and repulsive we cannot help disliking them.

In our social relations we find those who bring with them so much sunshine and harmony, we never tire of their presence; there are others, who bring such a dark cloud, their influence is dismal, and we wish them gone.

In business, we are attracted by a cheery, affable spirit, and repulsed by one that is stern and morose. We saw "Happy Joe," the potter, yesterday. He commenced seven years ago with fifty dollars, and now has eight thousand. He has earned half of it by laughing. It is astonishing how the dolorous, complaining and unhappy can do any business at all.

Especially in the professions, a man must be genial to prosper. He who carries a weight on his head, a grim visage on his face, and an icicle in his hand, is not the man to deal with the sick or the fallen.

There is little attraction, even in Christianity, where there is only enough possessed to make it a burden. A long-faced Christian, suffering from spiritual dyspepsia, is a monstrosity. But what is more attractive than its beauties, when radiating from a soul all aglow with love and good will?

TRUE EDUCATION is more than the routine of memorizing what is found in our school books; more than drinking the wisdom of our teachers; more than learning. It is being able to discriminate between the true and the false, to digest and assimilate the theories of science, and to cultivate, develop and mature muscles, brain and spirit, so as to become master of the necessities, privileges and grand possibilities of life. To be able to talk as the ancients talked, and to know what they knew, is well, if you have the time; but to be conversant with the grand facts now being developed all around us, is more important. To spend years in becoming familiar with the intricacies of mathematics, the technicalities of physical knowledge, and the mysteries of metaphysics, is laudable, if you have the capacity to grasp and retain and make useful all these things; but to be able to understand one important pursuit, and in its practice become proficient, so as to serve

the world well, is an education of which we may be proud. He that does this is pretty sure to know many things outside of this specialty, and to be useful in many departments of life; while in the work for which Providence has evidently designed and adapted him, and in which, by perseverence, he peculiarly excells, is to send out a light which enlightens the world. True education enables us so to elucidate and systematize facts as to make of them logical theories, and so to apply these theories to the great problems of life as to make life a success. It turns knowledge into wisdom, wisdom into a force, and this force into supremacy.

ALCOHOL AS FOOD.

The position taken by Dr. Faught, in the March ITEMS, that alcohol ranks second in the important liquid aliments of the body (water being first), we think entirely untenable. His opinion that, "as a beverage, it is a heavy stimulant, and, when carefully used may accomplish much good," has been the half-hidden rock upon which many a mariner has lost his ship. Equally dangerous and untenable is his assertion that "porter and ale are, at times, highly nutritious articles of food." His advice to laboring men that "it is well to reserve all stimulants until their day's work is over, when it may prove of some service," is quite as pernicious. If it acts as a stimulant, it is not the stimulant of nutrition, but the artificial one, that the whip is to the jaded horse—imparting no strength, and resulting only in greater exhaustion. Instead of its ranking "second in the important liquid aliments of the body," it is a foreign, demoralizing irritant, deranging the nerves, dethroning the reason, corrupting the passions, and smothering the conscience. The moment it enters the system, war rages till it is expelled, or till it has made its victim a degraded captive, and virtuous resistence is turned into perverted, debased desire.

It is astonishing that a man of Dr. Faught's intelligence should put into the hands of his fellows such a club with which to beat out their own brains! Rum is such an unmitigated curse, it is bad enough for the devil to recommend it, without his succeeding in getting good men to help him. The idea that alcohol is a necessary, normal and vital fluid of our body, is preposterous, and has been exploded long ago. It is on a par with the rumseller's plea that "there is alcohol in every living thing, from the lowest vegetable to the luscious grape." Alcohol is a rank poison, found no where but as the result of putrefaction, nor in all putrefaction. It is not "nutritious;" it is not an "aliment," a substance which feeds the body; it does not assimilate with the blood, or become any part of organized structure. It is thrown out of the system as it enters—still alcohol. The grain from which malt liquors are made, have to be subjected to a process of putrefaction,

and thus deprived of nutrition, before appearing as "porter and ale."

Dr. Wetherbee, of Boston, well remarks upon this proposition of Dr. Faught:

"There is no nourishment in alcohol. Our best American and foreign writers, who are level-headed, conclude that alcohol does not nourish. That conclusion is just and cannot be controverted. Alcohol and its twin brother, tobacco, are both narcotic poisons. Smoking and chewing should be eschewed, and alcohol should never enter the stomach."

Prof. Flagg, of Philadelphia, says: "I know all about the effects of rum and tobacco; for fifteen years past I have known nothing of them practically. I could speak from experience of both sides, and can testify against their use. I do not believe in the productive power of alcohol. I have never seen a case where its internal use has been beneficial; but, on the contrary, I have seen any number of cases carried to the grave by it."

We intended to reply to the position taken by Dr. Faught more specially, but have not the time.

Questions and Answers.

What is the best thing to facilitate the hardening of plaster of Paris?

Salt is good, but perhaps the best is alum. This, however, must be the potash alum, and not the ammonia alum.

Does the presence of accumulated tartar on the teeth indicate an abundance of lime in the system?

No. It indicates only that the lime which is always in the saliva, as it comes from the salivary glands, is met in the mouth by an alkalinity in the mucus from the mucus follicles, and precipitated upon the teeth.

Is it advisable for a dentist to recommend or prescribe phosphate of lime to a patient without consulting his family physician? W. A.

Yes, and no. Many dentists are not sufficiently educated in the needs and actions of medicine to prescribe independently; others are fully capable. As to phosphate of lime, and all other minerals taken into the system *as such*, many contend that the system cannot assimilate them. In other words, that nearly everything going to make up our bodies must first be prepared by passing through the process of vegetable life and growth. Where, therefore, there seems to be a want in the system for phosphate of lime or other mineral ingredients, it is better to prescribe in the diet such vegetables as prominently contain them.

Miscellaneous.

ALCOHOLIC NUTRITION.

BY REV. D. C. BABCOCK.

I have just read Dr. Faught's remarks on "Human Physiology," in the March "ITEMS," page 78, and am surprised at the grossly unscientific assertion that alcohol is in *any sense* an aliment. Alcohol is not food, but *poison!*

The "International Medical Congress" that met in this city in September, 1876, was memorialized by the *National Temperance Society*, on "Alcohol as a food and a medicine." The "section medicine" had before it a paper on those themes, and to that "section" the memorial was sent. The papers read were by Dr. Ezra M. Hunt, of Metutchen, N. J., and the conclusions to which he arrived were adopted. The action of the "section" was reported to and adopted by the General Congress, and the papers sent to the National Temperance Society, as the answer of the "Congress" to the request.

The first conclusion is: *Alcohol is not shown to have a definite food value by any of the usual methods of chemical analysis on physiological investigation.*" See "alcohol as a food and medicine," page 137, published by the *National Temperance Society*, New York. Lyonel Beale said, in the *Medical Times*, of 1878: It has been conclusively proved that alcohol is not a food, and Cameran, (Manuel of Hygiene, page 282) says: "There is nothing in alcohol with which any part of the body can be nourished." We might quote pages of such testimony.

Alcohol contains no nitrogen, and hence cannot aid to build up the body. No scientific fact has been more clearly established. For years the only thing that any scientist, worth naming, has ventured to do has been to guess that alcohol may be a "force food;" and that it may be consumed in the body as is coal in a furnace, and produce heat. That theory was exploded long ago. No one but our "belated reformer," Ex-Chancellor Crosby, has ventured to make an argument on that basis for years. In his "Calm View" he professes to quote Prof. Binz, of Bonn, Germany, as favoring that view, but he don't. He made forty-seven experiments on dogs, and found he had not guessed correctly. Even "half a glass of light hock, or a small glass of cognac," he says, caused a fall "in temperature" of two tenths of a degree in a very short time."

Men freeze quicker or "melt" sooner with this nerve-deadener in them than without it. It ought not to be necessary to write such plain facts for doctors in this year of the world.

After reciting the evil effects of this poison on the body, in his "action of alcohol on the body" page 24, Dr. B. W. Richardson says: "Was there no evidence of any useful service rendered by the agent (alcohol) in the midst of so much obvious evidence of bad services? I answer there was no such evidence whatever, and there is none."

Before any one ventures "to tie to" the assertions of Dr. L. Ashley Faught let him read the "Cantar Lectures" of Dr. Richardson. The paper of Dr. Hunt, above mentioned, Dr. Hargraves "Alcohol and Man," and "Alcohol and Science," a valuable prize essay, all published by the National Temperance Society. By the time he has gone through those works he will know something about the question, and be able to teach others Unless he can take time to do that much he had better not darken counsel by words without wisdom.

MONOPOLIES.

BY THE EDITOR OF THE DENTAL NEWS.

We have noticed there is being much said, pro and con, through dental journals recently, relative to monopolies in the manufacture and sale of dental goods. So far as combinations and monopolies interfere with legitimate competition in this branch of industry, we consider them wrong. According to the laws of trade established by common usage, no manufacturer of dental goods has any more right to fix the selling or retail price of his wares than has the manufacturer of dry goods or any other commodity. The merchant buys his goods as low as possible, and it is presumed the importer or manufacturer of the same sells them on as close a margin as can be afforded, and after the goods have left his hands, and been paid for, he no longer has a controlling interest in them. It now becomes the privilege of the buyer to retail them to the best advantage to himself, by either adopting the motto of "large sales and small profits," or by any other device by which he may legitimately realize upon them to the best advantage. This privilege is accorded to all merchants, and they expect nothing else at the outset but keen, sharp competition. By this means alone are goods in every day use kept at a fair margin above first cost. The manufacturer has no right to dictate to the dealer as to the prices he must ask for his goods, so long as the full purchase price has been paid, and the ownership changed hands. If one dealer, by a better system of business principles, is able to sell the same goods lower than his neighbor, who is to blame if not the short-sighted competitor, and who is benefitted more than the purchaser? The doctrine of Combination rule is to place a muzzle upon competition, and fasten high prices upon the consumer, which is at variance with the laws governing every other branch of trade, and contrary to sound judgment and

true business principles. But the manufacturers say: "We don't want our goods sold below our list prices." When manufacturers cease reaching for the retailer's profits as well as their own, then this will cease to disturb them, for, after they have sold at a handsome margin as importers or manufacturers—and that is the end of the bag that has the pudding in it—they ought to be satisfied, without establishing and running retail trade and forming combinations, in order to fortify their positions against other dealers who have paid all they asked for their goods, and yet are not allowed to sell them at such a profit as they deem proper. A bad feature of the Combination system, which has come under our observation, is that of allowing a member of the said Combination, in some instances, to sell below their established prices in order to secure a customer from an outside dealer. And so other means are used to force all dealers into the Combination, where the big fish will devour the little ones, and then all will be whales. But all the little fish are not "suckers," and some of the big ones are still afraid of the net, while the profession at large is able to see the drift of the whole matter, and is casting its influence on the side of justice and common sense.

THE following gives us a glimpse of the ancient: "*The Birth of Mankinde,* otherwise named *The Woman's Booke.* Set forth in English by *Thomas Raynalde, Phisition,* and by him corrected and augmented—whose contenents yee may reade in the table followyng, but most playnely in the prologue:

Imprinted at London by Richarde Watkins.
Cum Privilegio, 1568—
(Black Letter.)

"To keepe and preserve the teeth cleane:

"*First,* if they be very yellow and filthie, or blackish, let a Barber scour, rub and pick them cleane, it shalbe very good to rub them every day with the root of a mallow, and to pick them cleane that no meate remayne and putrifie between the teeth.

Item, take of the small, white pibble stones which be found by the water sydes, and beate them in very small powder. Hereof take an ounze, and of masticke one dram, mingle them togeather, and with this powder once in X days rub exactly your teeth, and this shall keepe your teeth fayre and white; but beware yee touch not ne vexe the gummes therewithall.

"*Item,* to stable and steadfast the teeth, and to keep the gummes in good case, it shall be very good every day in the morning to wash well the mouth in red wine."—*Quotation by Dr. G. L. Parmele, in New England Journal.*

WINTER EVENING AMUSEMENTS.

1. To apparently burn water, fill a glass lamp with water, and put into it for a wick a piece of gum-camphor. The lamp should not be quite full, and the camphor may be left to float upon the surface of the water. On touching a lighted match to the camphor, it shoots up a clear, steady flame, and seems to sink below the surface of the water, so that the flame is surrounded by the liquid. It will burn for a long time. If the camphor be ignited in a large dish of water, it will commonly float about while it burns.

2. Wet a piece of thick wrapping paper, then dry by the stove; while warm lay it down upon a varnished table or dry woolen cloth and rub it briskly with a piece of India-rubber. It will become strongly electrified, and if tossed against the wall or looking-glass, will stick some time. Tear tissue paper into bits one-eighth inch square, and this piece of paper, electrified, will draw them. Or take a smooth tea-tray, and put it on three dry tumblers. Lay the electric paper on it; and, on touching the tray, you will get a little spark; lift the paper out of the tray, and on touching the tray again, you will get another spark, but of the opposite kind of electricity; replace the paper and you get another, and so on.—*Illustrated Weekly.*

A QUEER PROPERTY OF THE OIL OF CLOVES.

PROFESSOR BOTTGER.

On dropping commercial oil of cloves upon perfectly dry oxide of silver, the oil takes fire almost immediately, with emission of sparks and expulsion of a strong smoke; on dropping the oil on peroxide of lead, smoke is expelled and the mixture turns hot, but does not ignite. The same is the case with chloride of lime. Permanganate of potassium and mercuric oxide behave differently. But on adding the oil to oxide of gold (obtained by decomposing magnesium aurate with nitric acid), sparks are emitted and the oil is ignited. The same occurs on dropping it upon perfectly dry silver dioxide, obtained by electrolysis. In all these cases, the metallic oxide is reduced to metal. After depriving oil of cloves of its eugenic acid, the remaining portion, which is free from oxygen, no longer exhibits the above properties.—*Polyt. Notizbl. and Chem. Zeit.*

ED. ITEMS:—I think the ITEMS is a perfect jewel; it is just what every dentist wants; it is worth ten times the price you put upon it. It is up to the times, and its wording is short and to the point, which makes it interesting. One can always find time to read it, and it pays a man for his time. Yours very truly,

F. W. BRANDON, Pittsfield, Mass.

IMPURE WATER MAKES IMPURE ICE.

BY PROFESSOR RAPHAEL PUMPELLY.

The necessity of selecting pure water from which to procure ice is seen in the following facts:

1. Water in freezing becomes freed from substances which in solution with it give a fluid of greater specific gravity than water alone; but it still retains, even some of these, entangled in the ice, and microscopic low forms of life—among which are the infectious germs.

2. Ordinary organic impurities are merely preserved from putrefaction during the period of their existence, in a frozen condition. Freezing is only a temporary arresting of the processes of decomposition, and these are resumed when the requisite temperature is again attained.

With regard to the effect of freezing on the specific characters of the low forms of life (the germs of infectious disease) we know that as germs they withstand a pretty good baking and freezing; but I think it is not yet settled whether they lose their infectious character in these processes.

It certainly seems to me that no less care is necessary in maintaining the purity of ice than of ordinary water; indeed, one should suppose that greater care would be necessary, for the following reason:

While, during the warmer season, the dead organic matter carried in streams and ponds is rapidly decomposed, or used up in nourishing plant and animal life; during the cold weather it tends to accumulate, and owing to its lightness, it may well happen that the ice in forming may entangle so much of it and of bacteria germs (those of infectious diseases) as to render the ice much more contaminated than a corresponding amount of drinking water from the same source.

HOW TO OBTAIN PURE WATER.

BY J. G. RICHARDSON, PHILADELPHIA, PA.

Water from small creeks, ponds, mill-dams, marshes, etc., is very apt to be impure, not having even the uncertain benefit of filtration through the earth to strain out the germs of various diseases. Many attacks of ague, bilious fever, and typhoid fever can be traced to drinking such water, and the eggs or young of sundry parasitic worms, and so forth, probably often gain an entrance into the stomach, and from thence to other parts of the system in this way.

One of the simplest and cheapest pieces of apparatus for purifying water is Dr. Parkes' cottage filter, which is thus prepared: "Get a common earthenware flower-pot, and cover the hole with a bit of zinc wire gauze, or of clean washed flannel, which requires changing from time to time; then put into the pot about three inches of gravel, and above that the same depth of sand washed very clean. Four inches

of animal charcoal (covered with a thin stratum of coarse gravel, or with a piece of slate to keep it in place) constitute the last layer; and the water should be poured in on the top and be received from the hole at the bottom into a large glass bottle. The charcoal will, from time to time, become clogged, and must then be cleaned by heating over the fire in a shovel. The sand or gravel should also be cleaned or renewed from time to time."

A convenient test for decomposing animal matter in water is the development of a putrid odor by standing twenty-four hours in a perfectly clean, well-scalded bottle. A pint-bottle, two-thirds full, and tightly corked, may be used, and if any disagreeable smell is discoverable the fluid should be carefully tested by a competent chemist before being employed for cooking or drinking purposes. Of course, a water may be very impure, and yet yield no foul odor when thus examined.

A wise precaution when traveling in unhealthy districts, or during the prevalence of an epidemic, is to drink none but boiled rain-water. To be effectual, the boiling should be continued briskly for half an hour or longer. Rain-water is preferable in many regions, because the hard water (containing lime) is but partially or not at all improved by boiling, and gives rise to serious diarrhœa in many of those unaccustomed to its employment, also, probably, to calculus disorders.

HEALTHY APARTMENTS.

Make it a rule neither to sleep nor eat in a house where the drains are not in perfect order, and do not trust to the absence of a bad smell as sufficient evidence that no poisonous effluvia are escaping from sewers, or any of the connecting pipes by which waste water finds its outlet. Above all, reject all stationary wash-stands in bed-rooms, or bath-rooms and other "modern conveniences," adjoining sleeping or living rooms. Such modern conveniences are in reality conveniences for the ready entrance of typhoid fever, diptheria, and other dangerous diseases into your dwellings, and all the ordinary forms of "traps" and ventilators, no matter how well they are kept in order, mechanically, seemed to have proved powerless to prevent the admission of these terrible maladies.

It is to be hoped that some sanitary Edison will soon devise effectual methods of sewerage, but until then, beware of the emanation from foul water in sewers, drains, etc., as you would of the poison of yellow fever or of small-pox, which, indeed, it may readily contain.

WATER bugs may be destroyed by the persistent use of dry powdered borax and pulverized sugar in equal parts. Use a bellows to force it into all cracks and crevices. The bugs will not eat borax alone, but will eat it if it is mixed with sugar.

IRON ON FIRE.

When considerable masses of iron are allowed to rust, a distinct elevation of temperature is often perceived. This is seen when a heap of iron turnings of from 10 lbs. 20 lbs. is moistened with water and exposed to the air. A curious illustration of the fact was afforded during the manufacture of the Mediterranean Electric Cable. The copper conducting wire of this cable was coated with gutta-percha; this was covered with a serving of tar and hemp, and the whole was enclosed in a strong casing of iron wire. The cable as it was manufactured was coiled in tanks filled with water. These tanks leaked, and the water was therefore drawn off, leaving a quantity of cable, about 163 nautical miles in length, coiled into a mass about 30 feet in diameter with an eye or central space of 6 feet; the height of the coil was about 8 feet. Rapid oxidation took place, and the temperature at the center of the coil, nearly three feet from the bottom, rose in four days from 66° to 79°, although the temperature of the air did not exceed 66° during the period, and was as low as 59° part of the time. In other parts of the mass the heat rose so high as to cause the water to evaporate sufficiently rapid to produce a visible cloud of vapor, and to give rise to apprehensions that the insulating power of the cable would be destroyed by the softening of the gutta-percha. No doubt the rise of temperature would have been still greater had it not been checked by the affusion of cold water; but the oxidation and the heating were renewed when the cooling was discontinued. The oxidation occurred only on the external surface of the iron wires, that portion in contact with the tarred hemp remaining perfectly bright."—MILLER.

HAD the sudden death of the Emperor Napoleon III, which took place an hour before the time appointed for the administration of chloroform for the purpose of an operation, occurred, as it might have done, while he was under the influence of the anæsthetic, it could hardly have failed to be set down to the temporarily debilitating action of the vapor on the heart. There would have been nothing in the results of the *post mortem* examination to contradict such a theory, as the appearances noted led to the conclusion that death resulted from a sudden failure of the heart's action. The Emperor had taken chloroform four times, and had always passed under its influence satisfactorily, and suffered no inconvenience from its inhalation. It speaks highly for chloroform, and for the care with which its administration was regulated, that this should have been so in a case where there was so large an amount of organic disease, and where the heart subsequently showed itself so prompt to fail.—*Medical Record, London.*

PHONETICS.

The following twenty characters are proposed mostly as additions to the ordinary letters, so as to make a phonetic alphabet of forty-three letters:

H ɥ	A a	Ʌ ʌ	Ǝ ə	I i	E e	⅄ ʎ	Ɔ ɔ	O o	U u	ꓤ ɹ R r
*a*rm	*a*nd	*ai*r	*ee*l	*i*ll	*e*ll	*a*ll	*o*ld	*o*n	*u*p	*re* e*r*

Ɯ ɯ	ʃ ʃ	Ɐ ɐ	I ı	Q q	X x	Ʌ ʌ	C c	⅃ ɟ	Ɩ Ʞ ʞ	Ǝ ɾ	Ꞓ ȣ.
t*oo*	t*o*	*a*le	*i*le	*oi*l	*ow*l	*u*se	*ch*u	*th*e	*th*in	*sh*e	*vis*ion	si*ng*.

⅃ʌr wʎz a tım hwen xr alfɐbet had but sikstən letrz and xr laȣgwɐj had fʌ mɔɹ sxndz. Az sxndz inkɹəst letrz wr multiplıd bı tumbliȣ ɟem abxt. B wʎz trnd ɹxnd tʃ mɐk d, and bɔɩ trnd upsıd dxn wiɟ n and m tʃ mɐk p q u and w, til wə had twenti-siks letrz and sxndz, wiɟ ɟe sxndz stil inkɹəsiȣ. Wə hav nx forti ɩɹə sxndz, and hav ʌzd meni dəvısez tʃ mak twenti-siks letrz ɹepɹəzent ɟem.

Wı not stand a fʌ mɔr on ɟʌr hedz? Wə ɟus get forti-ɩɹə, and spel fɔnetikali.

In ɟis nʌ dəl wə dɯ not nəd c, q and x, for ɟʌr ɔld sxndz, c iz ɹepɹəzented bı s and k, q iz a kompxnd oʌ k and w, and x oʌ ks or gz; sɔ wə ʌz ɟəz ɩɹə for uɟr sxndz.

Az Webstr ʞoz, ɟʌr ɥr tɯ sxndz ov r; ɟe hɥrʞ, tɹil, semi-vxl sxnd bəfɔr a vxl in ɟe sɐm silabl, and ɟə smɯɟ vxl sxnd in ʎl uɟr plɐsez.

Wə hav a sluvnli wa oʌ dubɩiȣ konsɔnents in meni wrdz oʌ tɯ or mɔr silablz. Let us avqd ɟis, unles ɟe sxndz oʌ bɔt ɥr pɹezent.

Oʌ kɔrsə wə ɹeʞognız ɟe tɯ sxndz oʌ th.

DEATHS.

Uhrich.—At Garden City, Kansas, January 4th, 1883, Dr. L. E. Uhrich, in the 21st year of his age.

[Young Uhrich graduated at the Indiana Dental College, in 1881 full of energy and hope, so soon to fall a prey to that dread disease, consumption.]

Dr. James H. Mann, of Poughkeepsie, N. Y., entered into rest Nov. 3d, 1882. Aged 56 years.

Though departing in the prime of life, he was in continual and successful practice in Poughkeepsie for more than twenty-five years. Such a man as a soldier would be "justly renowned;" as a lawyer, honorable; as a minister we would say of him, "well done;" as a dentist, let us emulate his faithfulness.

THE COMBINATION AT WORK.

EXTRACTS FROM THREE LETTERS ADDRESSED TO T. B. WELCH & SON.

LETTER NO. 1.

"We have used your G. and P. Alloy for over two years and have found it perfectly satisfactory. We ordered it this week of Codman & Shurtleff, Boston, and they sent an inferior Amalgam, saying, they could not furnish yours. We then ordered of S. S. W. Co., Boston, and they answered: 'We are unable to obtain Welch's Alloy' * * * Therefore we order from you four ounces."

LETTER NO. 2.

"Gents: Your Gold and Platina Alloy cannot be obtained in the city of Boston at the present time. Therefore I inclose my check for $10.00 direct to the manufacturers —please send 4 ozs. I have used your alloy for the past four years with good success and cannot do without it. Whenever you have anything of equal importance please advise me."

LETTER NO. 3.

"I have been using your Gold and Platina Alloy with great success, but was induced to try the 'Richest $3.00 Alloy in the market.' I'll not try the latter again for I do not like the combination—of the metals."

REMARKS BY DRS. WELCH & SON.

We are charged in a circular, issued by the Combination, of "misrepresenting the acts and purpose of the association." Does the Profession need us to tell them the reason why Codman & Shurtleff, and S. S. W. Co., and most others of the Combination do not keep our Alloy? We say the Combination has tried to force its members to refuse to sell our Alloy and other goods, and when we tell of it, the Combination don't like it.

The above are but samples of many letters that tell badly on the Combination; and it is no wonder the Profession suspicion them. We could name seven or eight members of the Combination who are doing their best secretly and otherwise to cause our ruin. It is no guess-work, for we have facts that are not to be disputed.

But while our enemies are throwing water on the fire, our friends are at work supplying the oil that causes our fire to burn brighter and brighter.

We ask Codman & Shurtleff and S. S. W. Co., WHY they cannot obtain our Alloy. Echo answers, *Combination.*

DEAR SIRS:—Please say in your next issue of ITEMS—by order of the President and approval of the Executive Committee, the next annual meeting of the Georgia State Dental Society, has been changed from May, 1883, to August, 1883—second Monday, to join with the Southern Dental Association, at Atlanta, Ga.

Respectfully yours,

L. D. CARPENTER, Cor. Secretary.